



U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND – GROUND VEHICLE SYSTEMS CENTER

GVSC Focused Industry Day - MaMoSaS Software Engineering Center

Mr. Jeff Koshko

Assistant Associate Director

Software Engineering Center

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AGENDA



- Who We Are
 - Labs **YOU** Can Use
- Who We Support
- Where We Are Going
- Where **YOU** Can Help Us (Our Gaps)
- How **YOU** Can Get To Us (Our Contracts)
- How **YOU** Can Contact Us



SOFTWARE ENGINEERING CENTER (SEC)



Mission:

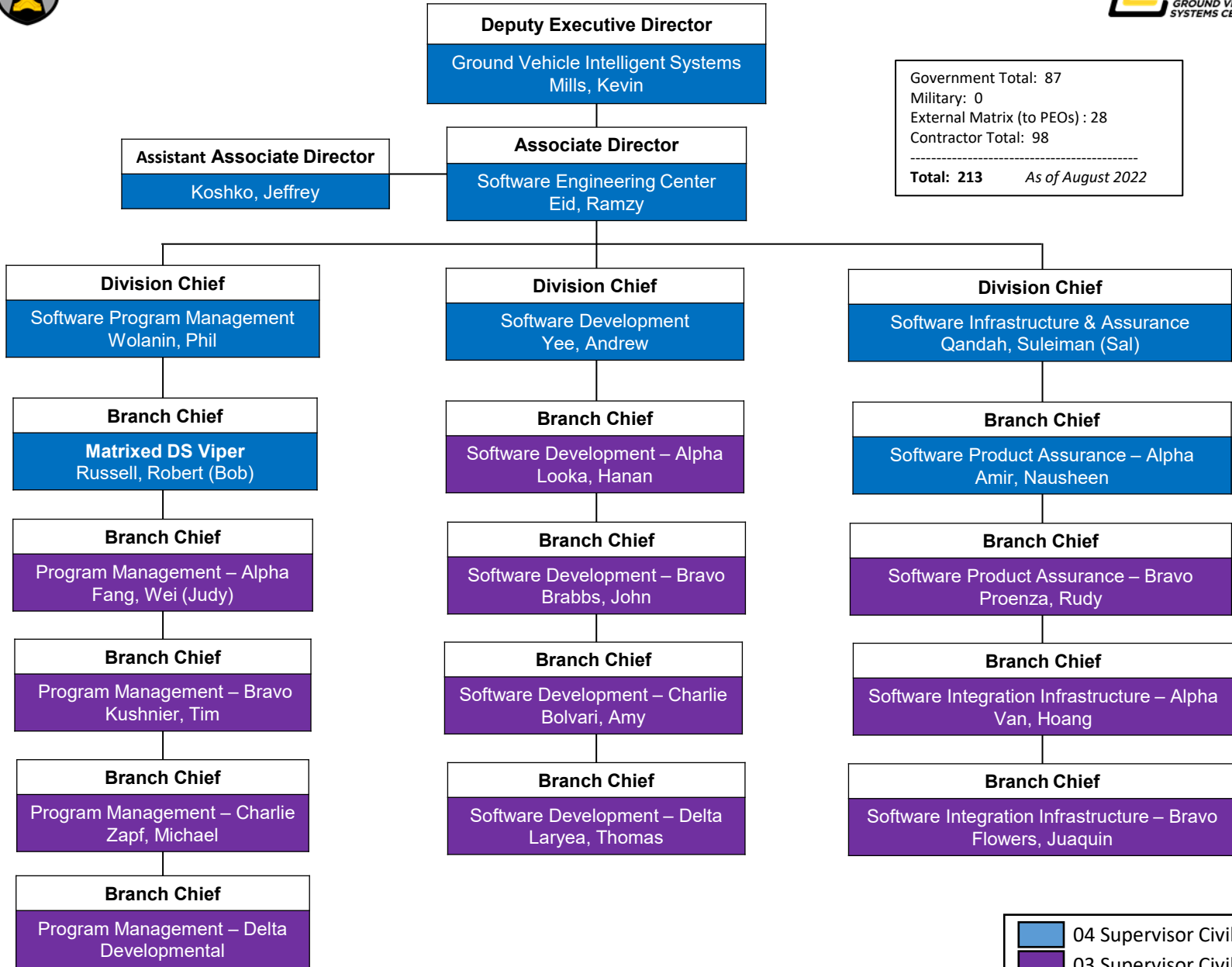
Provide **full software lifecycle management**; to engineer, develop, **integrate** and field precise software solutions; to improve **Current Force** effectiveness; and to provide superior software capabilities for the **Future Force**

Vision:

To be the **first-choice** software lifecycle engineering and management expertise for ground systems and support equipment - today and tomorrow.



SOFTWARE ENGINEERING CENTER



Government Total: 87
 Military: 0
 External Matrix (to PEOs) : 28
 Contractor Total: 98

Total: 213 *As of August 2022*

 04 Supervisor Civilian
 03 Supervisor Civilian



SOFTWARE ENGINEERING CENTER



Providing critical software **acquisition and postproduction software support** for Ground Combat and Combat Support Systems

Workforce

- Civilians
- Support Contractors
 - Multiple contract & industry partners

Facilities

- 70,000 square feet of available workspace
 - Locations at DTA, SANGB & Huntsville
 - High bays with tactical equipment essential for systems integration, software engineering and testing
 - Cleared for CCI equipment usage and storage
 - Existing support contracts in place to surge offsite as needed

Core Competencies

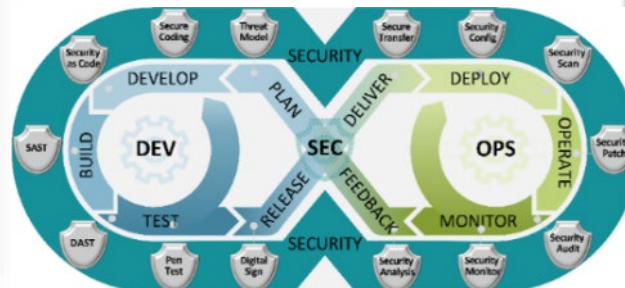
- Software Engineering Technical SME's
- Software Fielding SME's
- Software Project Engineering
- Software Architecture
- Software Process Improvement
- Software Development
- Software Test Engineers
- Product & Process Quality Assurance (PPQA) Engineers
- Software Lab & Tool Support
- Software Assurance
- Software Safety
- Software Configuration Management (CM)
- Embedded software engineering
- Independent Verification & Validation (IV&V)

Programs Supported

- Abrams V2 & V3
- Armored Multi-Purpose Vehicle
- Army Watercraft Systems
- Bradley
- DS-Viper
- Early Entry Fuel Distribution System
- Joint Assault Bridge
- Joint Light Tactical Vehicle
- M-ATV Key Leader Vehicles
- M1A1 Embedded Diagnostics
- Mission Enabling Technology – Demonstrator
- Mobile Protected Firepower
- Optionally Manned Fighting Vehicle
- Petroleum Quality Analysis System
- Prognostic Predictive Maintenance
- Robotic Combat Vehicle
- Route Clearance Systems
- Self Propelled Howitzer Systems
- Stryker Family of Vehicles
- Unmanned Ground Vehicles
- Vehicle Protection Systems



MATV Key Leader Vehicle Software Development Lab



Joint Light Tactical Vehicle Software Integration Lab



FUNCTIONAL AREAS



Software Business Development and Management



- GVSC CIE Engagement
- **Customer Interface**
- Customer requirements
- Customer Solution Coordination
- Program Management
- Statement of Work Development
- Memorandum of Agreement Development
- Software Acquisition Support
- Contract Management
- Contract data requirement list
- Development/Review
- Software Material Release
- Program Objective Memorandum Planning & Execution
- Budget/Funds Planning and Execution
- General Software Engineer Support
- **Matrix Personnel Interface**
- Matrix Employees Reach Back Support

Software Project Definition and Management



- Project / Program Initiation and Planning
- **Project / Program and Technical Execution Management**
- Schedule and Budget Management
- Financial, Contract and Business Operation Management
- Resource Management
- Risk Management
- Software Estimation
- Solution Identification, Definition, Execution and Delivery
- Vendor / Subcontractor Management
- **PPSS (Product Production Software Sustainment) Planning, Implementation and Management**
- Program Management Office (Delivery Excellence)

Software Development



- Software architecture Subject Matter Experts
- Development of robust modular software architectures
- Vehicle Management software development
- **Embedded software applications**
- Safety Critical Software
- Robotic vehicles software and controllers
- Vehicle Diagnostics & Maintenance tools
- Software Loader/Verifier tools
- **Software integration**
- Software Configuration Management
- Software sustainment
- Robust processes and level of rigor to meet safety standards and Cyber Security standards

Software Product Assurance



- Software Validation
- Software Verification
- **Test Automation**
- Functional Testing
- **Integration Testing**
- Code Reviews
- Reliability Testing
- **Automated Regression**
- System Testing
- System Testing
- Subsystem Testing
- Scenario Testing
- Performance, Load, Stress, Volume & other Tests
- Independent Verification & Validation (SW Safety)
- Secure Coding Assurance
- Static Code Analysis

Software Integration and Infrastructure



- **Software & Hardware Integration**
- Vehicle Systems and Subsystems
- Vehicle Simulations
- C4ISR Simulations
- Fault Testing
- First Article Testing
- Line-replaceable unit Testing
- Cable Testing
- Training
- Technical Manual Validation



SOFTWARE INTEGRATION AND INFRASTRUCTURE



The SEC Labs provides space and personnel to create and maintain facilities to support the entire life cycle of ground system software. This includes research, development, and design; maintenance, and integration; test, production, and fielding support; and transition to post-production sustainment activities.

<i>Capabilities</i>				
System Software Development	Testing	Power Studies	Training	Technical Manual Validation
Integration	Demonstrations	Human Factors Analysis	Simulations	Sustainment & Production Support
<p><u>GFE Integrated</u></p> <ul style="list-style-type: none"> • Blue Force Tracker 2 • WIN-T Inc 2 (PoP & SNE) • MFoCS computers • AN/PRC-155 (HMS Manpack) • RT-1523 (AN/VRC-92F) • AN/PRC-152 (AN/VRC-110) • AN/PRC-150 (AN/VRC-104) • AN/PRC-117F (AN/VRC-103) • AN/PRC-117G • SIXNET and Aeronix switches • Remote Weapon Station • Boomerang • CREW Duke • HMS Gen II • CAISI/VSAT STN • CABAIL 	<p><u>Security</u></p> <ul style="list-style-type: none"> • Onsite safes for weapons system/CCI equipment usage and storage • COMSEC Local Element • Alarm system with temperature, water, humidity sensors 	<p><u>Infrastructure</u></p> <ul style="list-style-type: none"> • AMPV, MATV, Stryker, and FMTV vehicles • Experience with mock-up cab linked with M&S capabilities: NGCV Soldier Trainer (IS), MATV • Capabilities of supporting Network Integration Evaluation (NIE) • Reconfigurable Software Integration benches • Vehicle Power replicated via an Alternator Stand • High bays support vehicle integration and testing • Integrated grounding bars 	<p><u>Communications</u></p> <ul style="list-style-type: none"> • Roof mounted GPS, BFT 1 and 2, and VSAT antennas • VIC-5 & VIC-3 network system • GPS repeaters for signals in high-bays • DREN service lines 	<p><u>Power</u></p> <ul style="list-style-type: none"> • UPS Power Backup • Custom-designed bench power supplies capable of powering 5 benches from remote HMI
<p>CCI = Controlled Cryptographic Item COMSEC = Communication Security M&S = Modeling and Simulation DREN = Defense Research and Engineering Network UPS = Uninterruptible Power Supply</p>				



SOFTWARE INTEGRATION AND INFRASTRUCTURE



Software Development, Integration, Validation, Verification & Sustainment

SIL-supported Systems

DTA 200C

Armored Multi-Purpose Vehicle (AMPV)
 Bradley
 Common Robotic System – Individual (CRS-I)
 MRAP Integrated Bridge (IB)
 Man Transportable Robot System Inc II (MTRS-II)
 NGCV MET-D Phase II
 Predictive Logistics
 Self Propelled Howitzer Systems Travel Lock
 Stryker Family of Vehicles
 WIN-T (INC2 and Next Gen)
 Petroleum Quality Analysis System Enhanced (PQAS-E)
 Petroleum and Water Trace Locator (PAWTL)
 Explosive Hazard Pre-Detonation (EHP) Roller
 Direct Support Electrical Systems Test Set (DSESTS)
 Robotic Software Integration

SANGB 194

Joint Light Tactical Vehicle (JLTV)

Future Outlook

Infantry Squad Vehicle (ISV)
 Optionally Manned Fighting Vehicle (OMFV)
 Opposing Force Surrogate Vehicle (OSV) Thermal Sight Unit (TSU)
 Paladin Integrated Management (PIM) A7

Partners & Customers

- PEO CS&CSS
- TACOM LCMC
- ILSC
- PM AMPV
- PM Bradley
- PdM RAS
- PM MRAP
- PM NGCV
- PM SPHS
- PM SBCT
- PM WIN-T
- PM PAWS
- PM JLTV
- PM PNT

AMPV SIL



NGCV MET-D SIL



Stryker SIL



MRAP IB / WIN-T SIL



Predictive Logistics SIL





SYSTEM INTEGRATION LABS

YOU CAN USE



DTA 200C

Armored Multi-Purpose Vehicle (AMPV)
 Bradley
 Common Robotic System – Individual (CRS-I)
 MRAP Integrated Bridge (IB)
 Man Transportable Robot System Inc II (MTRS-II)
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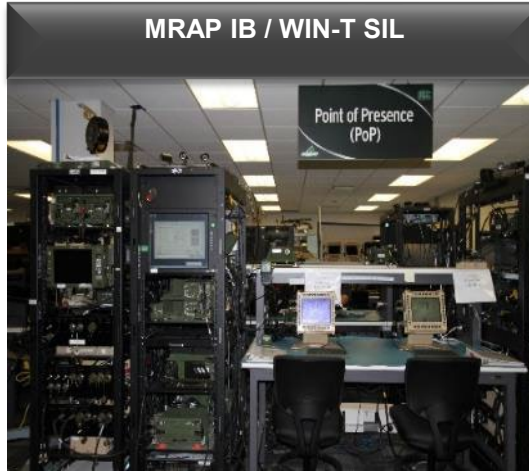
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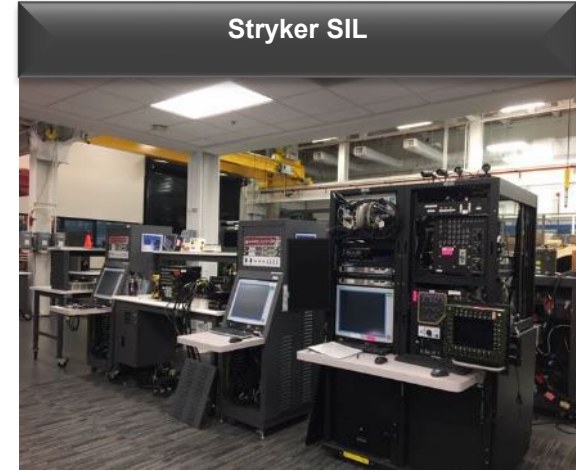
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MRAP IB / WIN-T SIL



Stryker SIL



AMPV SIL



NGCV MET-D SIL





SEC – SOFTWARE AND SIL SUPPORT



Enhanced Software Readiness Across PEO GCS Programs of Record



Abrams



Bradley



Stryker Family of Vehicles



Self-Propelled Howitzer



AMPV



LAV



SOFTWARE ENGINEERING COMPETENCY EFFORTS

- 1 Software Development + Software Architecture + Software Configuration Management
- 2 Software Sustainment + Postproduction Software Support (POM Collaboration w/ PM Programs)
- 3 Software Assurance (Software Unit/Integration/Regression Testing + Government Witnessed Testing)
- 4 Software System Integration Lab (SIL) - Establishment + Support
- 5 Software Safety (882E Compliance Analysis + ATEC Engagement)
- 6 Software Project Management (Lead Effort for Producing Software Deliverables)
- 7 Software Matrix Engineer (Embedded PM Co-Located Software Support)



VPS VBK - Bradley & Abrams LWR



- Direct Support Electrical System Test Set (DSESTS) - 2, 4, 6
- Electronic Maintenance System Next Generation (EMS Next Gen) - 1, 2, 3, 4, 6
- Predictive Logistics, DS Viper - 1, 2, 4, 6



SEC – SOFTWARE AND SIL SUPPORT



Enhanced Software Readiness Across PEO CS&CSS Programs of Record



MRAP Integrated Bridge



JLTV



JAB/ABV



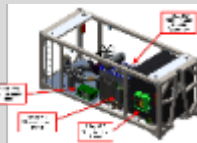
Watercraft Systems



M160



Route Clearance Explosive Hazard Pre-Detonation



Early Entry Fuel Distribution System



Petroleum Quality Analysis



MTRS-II, CRS-I, CRS-H



Autonomous Transport Vehicle



SOFTWARE ENGINEERING COMPETENCY EFFORTS

- 1 Software Development + Software Architecture + Software Configuration Management
- 2 Software Sustainment + Postproduction Software Support (POM Collaboration with PM Programs)
- 3 Software Assurance (Software Unit/Integration/Regression Testing + Government Witnessed Testing)
- 4 Ground Systems Software Integration Lab (GSSIL) - Establishment + Support
- 5 Software Safety (882E Compliance Analysis + ATEC Engagement)
- 6 Software Project Management (Lead Effort for Producing Software Deliverables)
- 7 Software Matrix Engineer (Embedded PM Co-Located Software Support)
- 8 Software Pilots (Automated Testing, Software Distribution, Cost Estimation, etc.)



SEC STRATEGIC CAPABILITY PROGRESSION



Near Term Capabilities:

- System Management
- Software Development and Sustainment
- Software Acquisition Support
- Software and System Integration Lab Environments
- Software Interoperability Certification Testing
- System Testing and Integration Engineering
- Software Configuration

Management

- Information Assurance
- Interoperability Engineering
- Embedded Systems Engineering
- Tools and Lab Environment Engineering
- Software Product Quality Assurance
- Software Architecture
- Software Requirements Definition
- Software Safety
- Software Material Release
- Software Process Development

Mid Term Capabilities:

- Software Test Automation & Simulation
- Independent Verification & Validation
- Open Software Architecture
- Software Product Lines
- Ground Vehicle System Safety Board
- DevSecOps / SW Modernization
- Cloud Development Environment

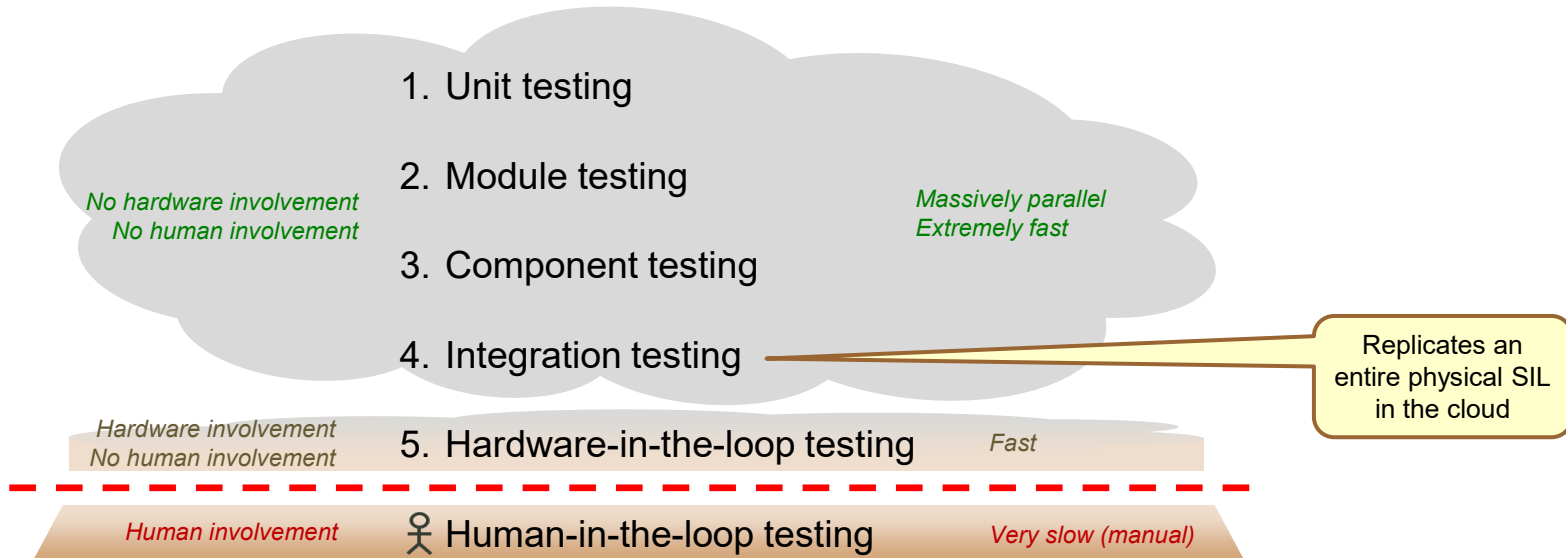
Far Term Capabilities:

- Vehicle Agnostic SIL
- Immersive Soldier engagement environment



SOFTWARE MODERNIZATION

Multi-Level Automated Testing



Testing only to written requirements is nowhere near enough

Must test software to the point of failure — at every level

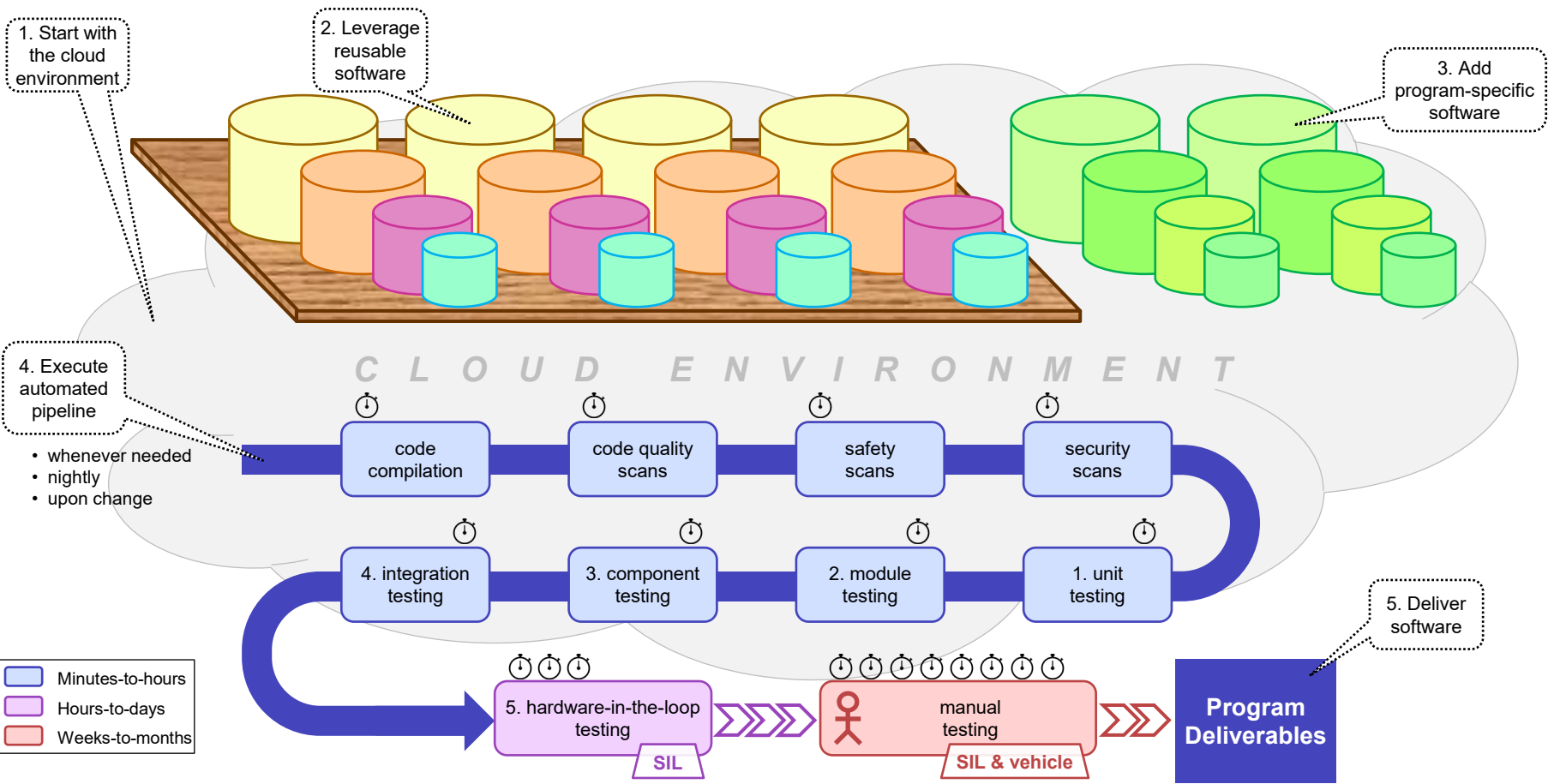
Automated testing lends itself to mass parallelization via the cloud

Comprehensive testing becomes the dominant variable in the trust equation



SOFTWARE MODERNIZATION

Process + Product — A Trip Through an Automated Pipeline





SEC GAPS **YOU** CAN HELP FILL



People, People, People

- Remote & Local Work Arrangements

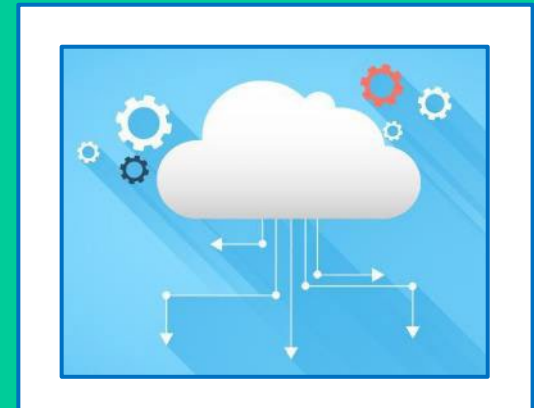


Embedded Software People (7 Open Positions)

- Developers
 - Automated & Simulation Test Expertise
- Product Assurance
- Project Leads
- Life Cycle Acquisition Support Leads

Cloud Development People (3 Open Positions)

- Cloud Infrastructure & Terraform Expertise





SEC CONTRACTS YOU CAN EXPLORE



Contract House	Contract Center	Contract No.	TAT # (if applicable)	Period of Performance
DCS Corp – TES Contract	ACC	W56HZV-17-C-0062	N/A	6/30/2023
Torch Phase III SBIR	ACC	W56HZV-20-C-0117	N/A	9/30/2024
ASRC	ACC	W56HZV-21-D-L042	N/A	3/31/2024
BAH	DTIC	FA8075-18-D-0004	P1-19-2022	2/28/2026
SAIC – MS2 Contract	DTIC	FA8075-18-D-0007	P1-19-2114	3/22/2026
HII (formerly Alion)	DTIC	FA8075-18-D0002	P1-19-2003	9/20/2025
KBR	DTIC	FA8075-18-D-0015	P1-21-2216	6/26/2027
ManTech	GSA-Oasis	GS00Q14OADU324	47QFCA18F0015	11/15/2022



SEC POINTS OF CONTACT FOR YOU



Ramzy Eid - Associate Director
ramzy.w.eid.civ@army.mil

Jeff Koshko - Assistant Associate Director
jeffrey.a.koshko.civ@army.mil

Andrew Yee - Division Chief Software Development
andrew.yee1.civ@army.mil

Phillip Wolanin – Division Chief Software Program Management
phillip.d.wolanin.civ@army.mil

Suleiman Qandah – Division Chief Software Infrastructure & Assurance
suleiman.s.qandah.civ@army.mil